

UNIVERSITY OF WARSAW
FACULTY OF ECONOMIC SCIENCES



HIGHER EDUCATION EFFICIENCY AND QUALITY
SUMMARY

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Dissertation

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Introduction

The paper presents the methodology proposal for measurement the efficiency and quality of main processes (didactics and research) carried out by higher schools. In addition, an analysis of organizational effectiveness was carried out based on financial indicators.

The issue of the functioning of a university is particularly important in the context of one of the priorities of the Europe 2020 strategy¹: ("smart development: development of a knowledge-based economy and innovation"). Universities should meet new social requirements, especially in the area of quality. For the management by the university management and coping with the pressure of employers, it is crucial to pay attention to such factors as: adjusting the teaching content and anticipated educational effects to the needs of the economy, inconsistent demographic prospects, especially in the context of population growth and the age structure of the population economic in making decisions regarding the functioning of the unit. The above dilemmas create the necessity of introducing constant monitoring of efficiency and the rarely mentioned quality of the university.

Research assumptions

The research goal set at work has been achieved. The relationship between efficiency and quality in the case of state higher schools in the area of main processes (didactics and research) was specify. In the area of supporting processes (general university administration) which include processes such as accounting, IT, staff, organizational efficiency was assessed.

The measurement of the efficiency and quality of higher education institutions made it possible to verify the research hypothesis put forward in the work on the inversely proportional relationship between the efficiency and quality of the university. In the majority of analysed universities (77%) in the case of the highest level of efficiency² in the research sample, they showed a relatively low level of quality³. The above result indicates that in the case of the majority of higher education institutions included in the research sample, the research hypothesis cannot be rejected.

The carried out research allow to answer the (four) questions posed in this work.

¹ In 2015 for which the study was carried out.

² equal to 1

³ The calculated quality index at a lower level than the average for the tested sample.

The paper answers the question "How to define and measure quality in the case of a higher school?". It was stated that the quality of a university should be defined and measured in the context of the effectiveness of its implementation of its basic goals resulting from a social responsibility. In connection with the above, you can distinguish the so-called internal and external quality. A number of qualitative dimensions is a criterion for the effectiveness of the university's functioning (achieving the set goals) in the public environment and becomes, beside economic criteria, the basis for the assessment of its activity.

The study also made it possible to answer the second research question „What are the relationships between the concepts of efficiency and quality, and to what extent the concepts of efficiency and quality can be used to analyse and assess the functioning of a public university?”. For the university it has been shown that it is important to achieve the quality desired by the stakeholders. However, it is possible only if the appropriate level of efficiency is maintained (understood as "securing" a sufficient level of resources, mainly financial resources, in order to be able to continue its activity). It results from the specificity of the functioning of a public university, which functions as a service towards society and its activity is not profit oriented. Therefore, the university should not seek to maximize profits. Nevertheless, it should pay attention to run a activity with rational management of limited resources, which translates into the need to control costs.

Thanks to the conducted research it is also possible to answer the third research question “How should the obtained results be interpreted and how their interpretation changes in the context of a joint analysis of indicators characterizing quality and effectiveness?”. The results of the efficiency and quality research should be interpreted together. It has been shown that the university assessment may differ significantly, depending on the assessment of efficiency and quality separately or in combination. It is crucial to examine the measurement results in the context of processes carried out by universities⁴. Only the analysis of the results based on the two above-mentioned criteria will enable a comprehensive assessment of the university's functioning. The results of measuring the functioning of universities, obtained in accordance with the methodology proposed at work, can be used in the process of improving the functioning of the university in accordance with their mission and expectations of stakeholders (including students, employees). In terms of didactic activity, in the research sample, while analyzing the quality in internal terms, the highest level of efficiency and a

⁴ Two basic: didactics and research.

relatively high level of quality were demonstrated by three universities⁵. With the adoption of the highest level of efficiency in the didactics process and the high level of external quality, perceived through the prism of the speed of finding a job by the student after graduation, four universities met both criteria⁶. Most (six universities) simultaneously showed the highest level of efficiency and high level of quality in the case of the research process⁷. From the above, it is clear that the measurement of only the efficiency is not always sufficient for the correct assessment of the university.

Responses to the fourth research question were also answered: “To what extent the DEA method can be used and is useful in measuring the cost effectiveness of a university?”. The DEA method can be used and is useful in measuring the efficiency of universities, which was demonstrated in the literature review and confirmed during the research. The usefulness of the method results from the specificity of factors that are taken into account when performing measurements on institutions such as higher schools. Some of the factors are determined in non-monetary values⁸. In addition, when using it, it is not necessary to know the mechanism of transmission from input to the output (product)⁹. The presented work presents an analysis of economic efficiency using the DEA method. This method allows to evaluate the efficiency of processes carried out by universities. Using the method, the relationship¹⁰ between inputs¹¹ and generated products is examined. The justification for its use is reflected in the literature on the subject¹².

Structure and content of the dissertation

The work consists of 5 chapters. Chapter 1 presents the concepts and basics of research on efficiency and quality. The next chapter describes the research tool (methods) that can be used

⁵ Cracow University of Economics, University of Silesia in Katowice and University of Łódź.

⁶ University of Warsaw, University of Silesia in Katowice, Cracow University of Economics and University of Łódź.

⁷ The Poznań University of Economics, University of Silesia in Katowice, University of Warmia and Mazury in Olsztyn, Wrocław University of Technology, Nicolaus Copernicus University in Toruń oraz University of Wrocław.

⁸ For example, the number of: students, ongoing research projects, publications.

⁹ For example, how to organize classes, division of students into study groups.

¹⁰ How much effort is needed to generate a product, it is not important the knowledge about way to convert input into output.

¹¹ Costs incurred in connection with ongoing processes.

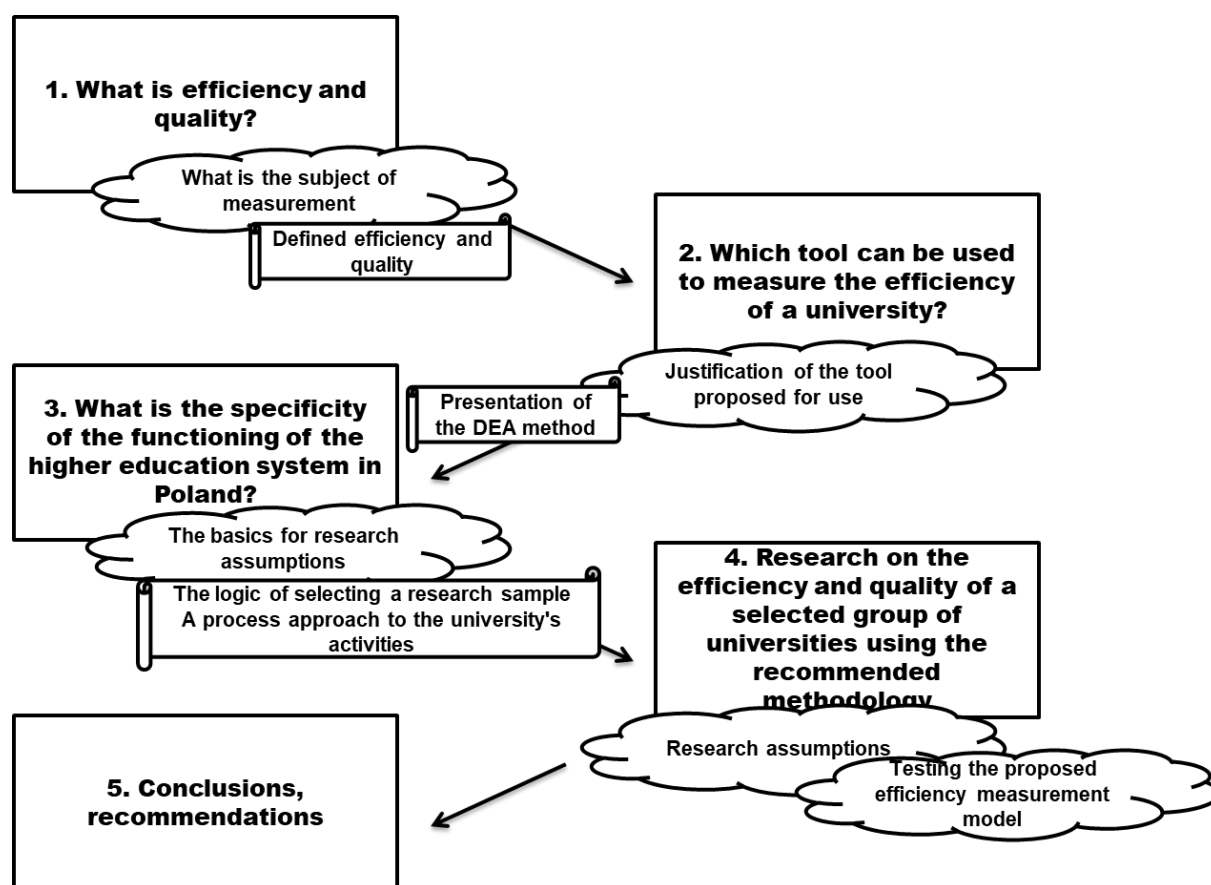
¹² Research on higher education has been carried out, inter alia in England (Thanassoulis, Kortelainen, G Johnes and J Johnes, 2011; Bradley, Johnes, Little, 2006), Spain (Taylor and Tyler 2012), Austria (Leitner, Prikoszovits, Schaffhauser-Linzatti, Stowasser, Wagner, 2007), America South (Taylor, Harris, 2004), Canada (Mcmillan, Datta, 1998), Chile (Ramírez-Correal, Peña-Vinces and Alfaro-Pérez, 2012), Japan (Kaneko, 1997), Australia (Taylor).

to analysis the efficiency of the university's functioning. The non-parametric method of DEA will be used as a tool that can potentially be used to carry out the university's efficiency research. The theoretical basics of using the proposed tool were also presented. Then an analysis of empirical research using the DEA method was carried out. Chapter 3 presents the characteristics of the functioning of the higher education system in Poland. In the last two chapters (4, 5) the conducted research on the efficiency and quality of a selected group of universities using the recommended methodology as well as conclusions and recommendations for the future were presented.

In this work, the definitions and methods for their measurement, which are described in detail in Chapter 1, were used as the basis for determining the efficiency and quality. The above statement confirmed the applicability of the content presented in Chapter 1. In the case analysed, it can be concluded that the practice is consistent with the theory.

The plan of efficiency and quality testing in higher education is presented in Figure 1.

Figure 1. The plan of the efficiency and quality research in higher education



Source: Own elaboration

Research method

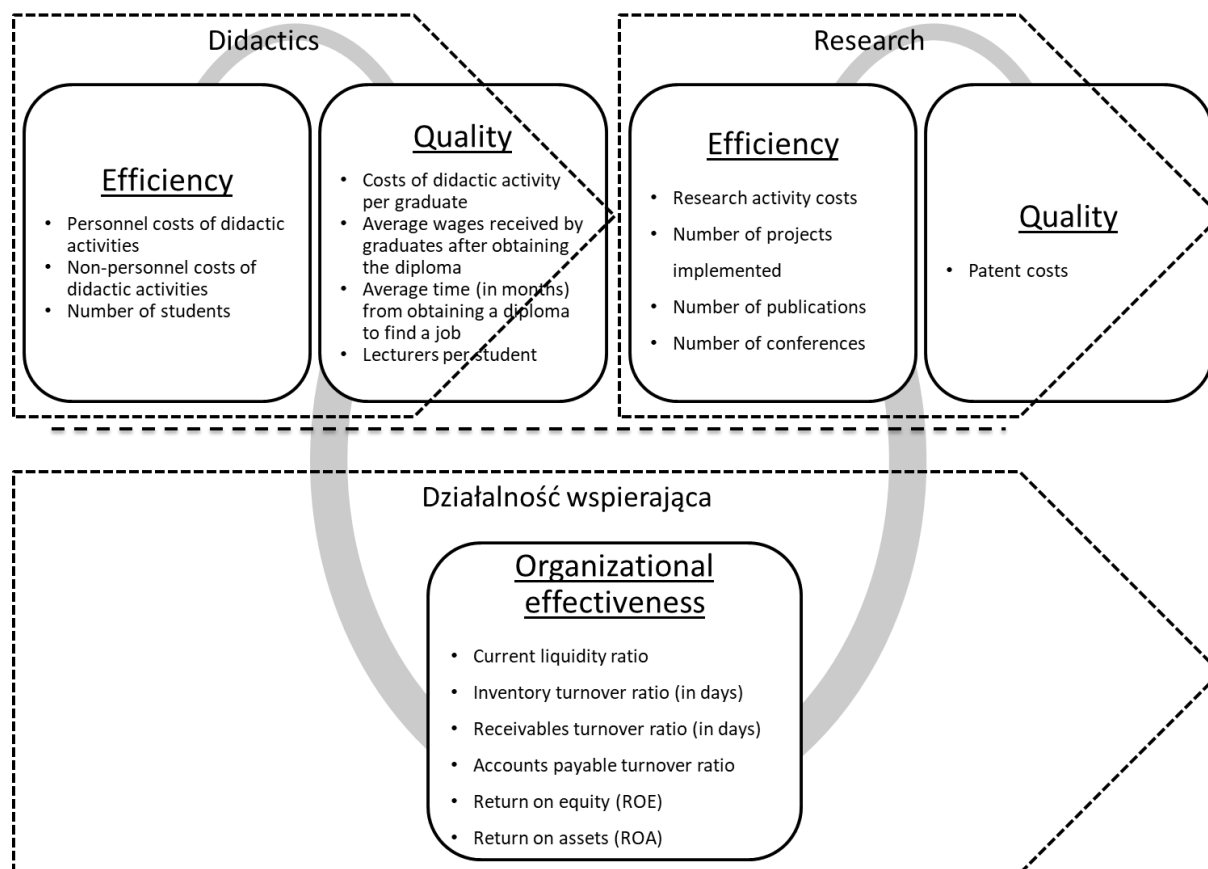
The non-parametric measurement method (DEA) was used to measure the efficiency of the higher schools. Among the main reasons for choosing this method is the fact that when using the tool, it is not required to know the functional dependence that occurs between the variables included in the study. It is only necessary to determine the inputs and effects that do not necessarily have to be expressed in monetary units. The results obtained in the study using the DEA method allow to determine the situation of the university for the period covered by the study (it is 2015).

The research was conducted on a research sample of 22 public universities. Among the criteria of choosing a research sample were: the size of university (mainly in light of the number of current students), diversity of university based on available study paths (university, higher school of economics, technical university), the size of the city where the campus is located (big cities), application by the university of an integrated system of recording economic events. The research group included universities that in 2015 educated the largest number of students in the main functioning profiles: 10 universities, 6 technical universities and 5 academies of economics as well as 1 agricultural school.

Calculating efficiency (both with fixed and variable effects of scale) was conducted using EMS programme. Diagrams were created using SPSS programme .

The logic diagram of the methodology for conducting the study of the efficiency and quality of the higher education institution was presented in Figure 2.

Figure 2. The logic diagram of the methodology for conducting the study of the efficiency and quality of the higher education institution



Source: Own elaboration

Recommendations

Data collection phase for the study

As research carried out under this work has shown, a key starting point for measuring the efficiency and quality of universities is to have comparable data on their functioning. Most importantly, for the measurement to be made by stakeholders¹³, the data should be publicly available and collected using a uniform methodology. The study was based on the financial reports of the university, reports of university rectors, data collected and published by the Central Statistical Office and published on the POLon portal. In the course of data collection for the study, the Author encountered the problem of the lack of a uniform methodology of data recording and calculation of indicators published by universities. For this reason, the obtained results may be distorted by differences in the methodologies used by universities in

¹³ Among them, the main groups are the university management, students and employers.

the collection and sharing of data. There are cases in which the Rector's reports give information on the number of people employed at the university or on the full-time employees of the universities. There is also no explicit indication about methodology of the cost of didactics calculation. It may happen situation in that the universities include the whole entire costs of maintaining the real estate in which classes are conducted, to the cost of didactic activity (because the university must keep the rooms in constant readiness to conduct classes). We also distinguish universities which, to the costs of didactics, include only part of the costs of maintaining real estate in which didactic classes are conducted. Costs are disclosed only in proportion to the time in which classes are actually conducted in the teaching rooms (because if there are no classes in the classrooms, they can be used to conduct other activities¹⁴).

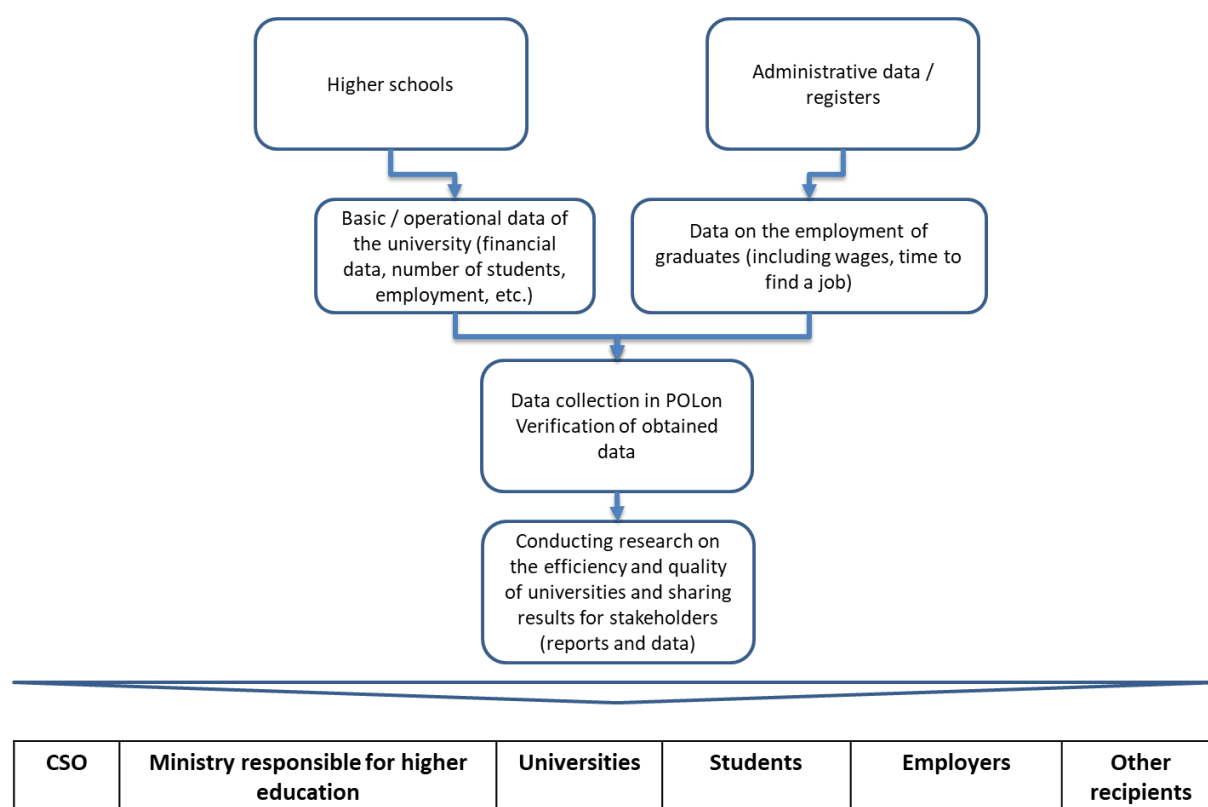
Potentially good sources of information that could be used to measure the efficiency and quality of universities are data available in the POLon system¹⁵. The proposal for a scheme for collecting data on higher education is presented in Figure 3.

¹⁴ The costs incurred when the rooms are not used, in this case can be described as the costs of so-called unused production capacity (empty costs). In a situation where the above cost accounting logic does not apply to all universities, units displaying empty costs, as a rule should show lower efficiency indicators (in the above area).

¹⁵ On the portal page you can find information that the system should:

- providing data for the needs of official statistics for the Central Statistical Office;
- electronic reporting of universities and scientific units;
- verification of diploma theses;
- supporting the assessment of the quality of education;
- providing objective information on science and higher education for students, candidates for studies, academics and entrepreneurs;
- reliable assessment of the scientific potential and rational disposition of funds for science and higher education.

Figure 3. Proposal for a scheme for collecting data on higher education



Source: Own elaboration

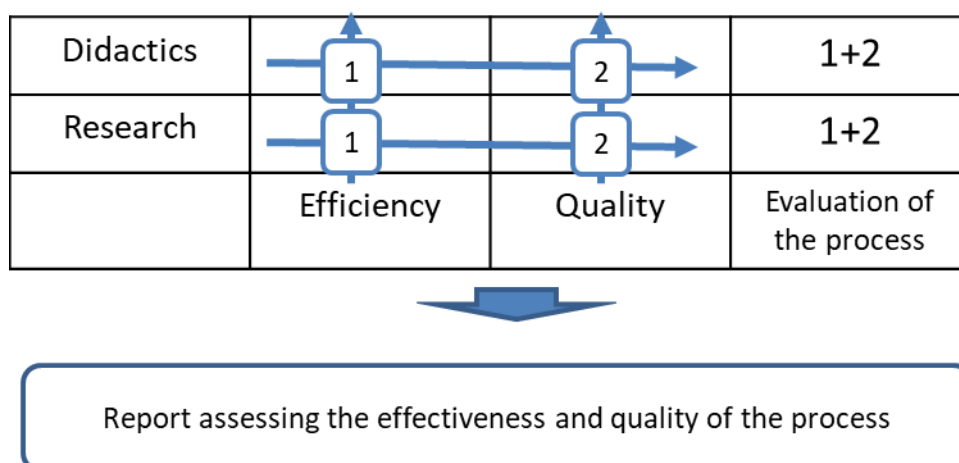
Based on the conducted research, the Author proposed a set of characteristics that should be determined during data collection:

- type of necessary data (e.g. number of students, value of costs in a generic breakdown by didactics, research, others);
- format of collected data (e.g. MS Excel);
- the frequency of data collection (e.g. periodically, annually for a given period, data per day, on an on-going basis);
- responsible for data sharing (e.g. university, employee, state registers like Social Insurance Institution);
- responsible for monitoring the collection of data (timeliness of data received, their correctness).

The phase of the research methodology

The key requirement of the analysis of the efficiency and quality of public universities is to have objective and comparable pre-defined data on the units under study. Both the efficiency (cost) as well as the quality of the university should be examined. Evaluation of only one of the two above-mentioned aspects may result in receive limited information about the university. In addition, the analysis should not be conducted for the university as a whole but for processes carried out by universities. The minimum level of research should be based at the main processes carried out by universities (didactics, research).

Figure 4. The proposed logic of researching the efficiency and quality of major processes carried out by higher schools



Source: Own elaboration

In view of the above, it seems advisable to develop at the national level ("over the universities"), eg at the level of the Ministry responsible for higher education, one methodology for conducting higher education efficiency and quality research. The Author of this work has formulated the following areas, which should be included in the developed efficiency and quality research methodology:

- indication of the processes carried out by universities;
- taken into account the expenditures, products and results of the functioning of the university, which will appropriately enable the measurement of efficiency and quality;

- an indication of the IT tool (program) that should be used to conduct the research;
- proposals for the form of presentation of the results obtained.

The successive research on the efficiency and quality of higher education institutions can be modeled on the solution adopted in the monitoring of the graduates' fate. As part of the above, reports are generated and published centrally on the POLon portal. In the case of efficiency and quality measurement, consideration should be given to the development of a standard report, which will be periodically (eg on an annual basis, after the publication of financial statements by universities) made available on the website of the "Integrated Information System on Science and Higher Education".

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JEL codes

I230, I220, I230, M400, M100, R32